REMARKS

Claims 1, 3, 5-8, 10-20, 22, 24-28 and 30-43 are pending. Claim 1 has been amended to recite the subject matter of canceled claim 4.

Claims 2, 4, 9, 21, 23, 29 and 44-77 have been canceled.

Claims 1 and 3-8 are rejected.

Claims 10-12 are objected to.

Claims 13-20, 22, 24-28 and 30-43 are allowed.

No new matter has been added by way of the above-amendment.

I. Interview

Applicants note with appreciation that the Examiner has conducted a telephonic Interview with Applicants' representative, Garth M. Dahlen, Ph.D., Esq. (#43,575) on July 17, 2007. The Examiner was very helpful in clarifying the outstanding issues. This Amendment coupled with the attached Declaration are in direct response to the Examiner's comments made in the Interview. Details of the Interview are given below in the discussion of the prior art based rejection.

II. Prior Art Based Issues

The Examiner has maintained the rejection of claims 1 and 3-8 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Malmberg *et al.* (Macromolecules, 1998). Applicants respectfully traverse the rejection.

As the Examiner will note, Applicants have amended claim 1 as discussed during the July 17, 2007 Interview, i.e., claim 1 has been amended to recite the subject matter of claim 4 and claim 4 has been canceled. Furthermore, as discussed in the Interview, Applicants enclose herewith a Declaration under 37 CFR 1.132 by one of the coinventors, Mr. Naoto MATSUKAWA which is evidence that Malmberg et al. does not teach or suggest the subject matter of currently amended claim 1.

Currently, claim 1 recites that the inventive ethylene (co) polymer (A1) which is either an ethylene homopolymer or a copolymer of ethylene and an α-olefin of 4 to 20 carbon atoms, comprises the following Features:

(iv_{A1})[1] the number of branches having a length equivalent to that of hexyl or longer measured by ^{13}C-NMR is less than 0.1 per 1,000 of carbon atoms, and

(v_{A1}) the intrinsic viscosity [η] in dl/g measured at 135°C in decalin and the melt flow rate MFR in g/10 minutes measured under 2.16 kg load at 190°C satisfy the following relations:

$[\eta] > 1.85 \times MFR^{-0.192}$ when MFR < 1, and

$[\eta] > 1.85 \times MFR^{-0.213}$ when MFR ≥ 1.

In the Declaration, Mr. MATSUKAWA describes experiment(s) to determine that none of the polymers of Malmberg et al. have this combination of Features (iv_{A1}) and (v_{A1}).

Sample B5 is discussed at page 8450, 2nd column, lines 5-6 from bottom of Malmberg et al., and is the only example wherein the amount of branching is described. Accordingly, in Mr. MATSUKAWA's opinion, only Sample B5 of Malmberg et al. could meet the branching Feature (iv_{A1}) of claim 1. In the Declaration, Mr. MATSUKAWA used essentially the same experimental conditions as disclosed in Malmberg et al. to find that Sample B5 of Malmberg et al. does NOT meet the requirement of Feature (v_{A1}) as required by current claim 1.

Mr. MATSUKAWA used essentially the same experimental conditions as disclosed in Malmberg et al., which are disclosed in detail in the Declaration and are summarized in the following Table 1.

Table 1 : Polymerization conditions

Sample	Catalyst: mM	Co-catalyst: mM	Ethylene Flow rate: L/hr	Polymerization Temperature:	Polymerization Time: min.	Yield: g
Run #1	0.0008	4.0	100	80	5	6.51
Run #2	0.0008	4.0	100	80	5	6.84

[1] The numbering of the Features as used herein are the same as used in the claims.

The product of the workup has the characteristics shown in the following Table 2:

Table 2 : Physical Properties Of Polymer Obtained

Sample	Mn	Mw	Mw/Mn	[η]: dg/l	MFR	*1
Run #1	3.32×10^4	6.68×10^4	2.0	1.44	1.70	1.652
Run #2	3.45×10^4	6.87×10^4	2.0	1.52	1.09	1.816

*1 = $1.85 \times MFR^{-0.213}$

As shown in Table 2, the MFR and intrinsic viscosity [η] relationship described in Feature (v_{A1}) of claim 1 is not satisfied, i.e., Sample B5 of Malmberg et al. does not meet the requirement of $[\eta] > 1.85 \times MFR^{-0.213}$ when $MFR \geq 1$.

This data was discussed in the July 17 Interview with the Examiner. In general, the Examiner responded by indicating that it is important that the polymerization conditions are representative of the prior art. With regard to this matter, the Examiner was concerned that there are distinctions between the polymerization conditions shown in the above Table 1 and the teachings of Malmberg et al. with respect to Sample B5. These alleged distinctions that the Examiner discussed in the Interview are addressed in the Declaration and below.

II-A: Catalyst/Co-catalyst Ratio

The Examiner notes that in the polymerization conditions of Run #1 and Run#2, the co-catalyst/catalyst ratio is 5000/1. However, the description in Malmberg et al appears to be silent with respect to the catalyst and co-catalyst concentrations.

This apparent distinction is discussed by Mr. MATSUKAWA in the Declaration. In the Declaration, Mr. MATSUKAWA states:

> ...[T]he Examiner expressed during the recent Interview with my representative, Dr. Dahlen, that the ratio of catalyst to cocatalyst is an important variable. The Examiner is aware that Malmberg et al. do not disclose the ratio of

> catalyst/cocatalyst. The Examiner is concerned that the catalyst/cocatalyst ratio affects the MFR and intrinsic viscosity [η] of the Sample B5. I respectfully disagree with the Examiner.
>
> First, if the ratio of catalyst/co-catalyst greatly affects the properties of the polymer produced, then it makes sense that Malmberg et al. have not placed into possession of the public the polymer of Sample B5. In other words, based on this logic, if the ratio is not disclosed, then Sample B5 of Malmberg et al. could not be reproduced.
>
> Second, I conducted the experiments to show that Sample B5 does not satisfy the equation regarding MFR and [η] of the present claim, believing that the effect of the co-catalyst/catalyst ratio is small. It is my opinion that the experiments described herein are sufficient to show that the Sample B5 does not satisfy the relation of the claim regarding MFR and [η].
>
> It is my opinion that since the polymerization conditions are not disclosed in Malmberg et al., it is logical to assume that the polymerization conditions are in the normal range that one skilled in the art would select. As such, there is not a big difference between the polymerization conditions of the experiments described herein and that of Malmberg et al. (Emphasis in original.)

II-B: Polymerization Time

The Examiner noted in the Interview that the polymerization time used in Run #1 and Run #2 is 5 minutes whereas the polymerization time in Malmberg et al. is 60 minutes. This apparent distinction is not relevant as explained by Mr. MATSUKAWA in the Declaration. In the Declaration, Mr. MATSUKAWA states:

> I am aware that the polymerization time used herein is different from that described for the sample disclosed in Malmberg et al. Specifically, the polymerization time of the experiment (5 minutes) is different from that of Malmberg et al. (60 minutes). However, for the following technical reasons, it is my opinion that the difference in polymerization time would not significantly affect the ratio of intrinsic viscosity [η] and MFR-0.213.
>
> The polymer of Malmberg et al. is obtained by polymerizing olefins using a metallocene catalyst. The mechanism of the olefin polymerization is called an addition polymerization. ...

> With respect to polymerization, there are chain reactions and stepwise reactions. In the case of addition polymerization, the reaction proceeds with chain reaction. The average molecular weight is constant regardless of polymerization time.
>
> So the polymer properties such as MFR and intrinsic viscosity, which are closely related to the molecular weight of a polymer, are not expected to change with time. As such, it is my opinion that the difference in polymerization time between Sample B5 of Malmberg et al. and the polymerization time reported herein would not significantly affect the ratio of intrinsic viscosity [η] and $MFR^{-0.213}$.

In conclusion, it is Mr. MATSUKAWA's opinion and the opinion of Applicants that none of the polymers of Malmberg et al. have the inventive combination of Features (iv_{A1}) and (v_{A1}). As such, withdrawal of the rejection is respectfully requested.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Conclusion

In view of the above remarks, it is believed that claims are allowable.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Garth M. Dahlen, Ph.D., Esq., Reg. No. 43,575 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

Dated: August 23, 2007

Respectfully submitted,

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Attachment: Declaration under 37 CFR 1.132 by Mr. Naoto Matsukawa